

CLAIMS

1. A magnetic tape cassette, comprising:

a cassette case including upper and lower halves (2, 42) and including an opening (49) at the front end thereof, said upper half including a side surface on which a projecting portion (6) is formed;

a pair of reels (44,45) respectively so stored within said cassette case as to be freely rotatable and around which a magnetic tape (M) can be wound;

a lid (50) for closing said opening and covering said magnetic tape passing through said opening, said lid having a side plate (55a) on which a support shaft pin (61a) and a projecting portion (65) are projected;

a lid lock (59a) for locking said lid in its closed state; and

a lid spring (71) capable of energizing said lid (50) in its closed state and also energizing said lid lock (59a) in a closing direction of said lid, said lid spring (71) having a coil portion (71c),

wherein a coil portion (71c) of said lid spring is mounted in a loose fit manner on said support shaft pin (61a), one leg portion (71a) of said lid spring (71) is secured to said projection portion (65), and the other leg portion (71b) of said lid spring is secured to said projecting portion (6) and can be engaged with said lid lock (59a) from said upper half side to thereby energize said lid lock in the closing direction of said lid.

2. The magnetic tape cassette according to claim 1,

wherein said upper half comprises:

5 a position restrict means contacted with an outer periphery of said coil portion (71c) of said lid spring for restricting a position of said coil portion relative to said support shaft pin in such a manner that an inner periphery of said coil is kept disengaged from said support shaft pin.

10 3. The magnetic tape cassette according to claim 2, wherein said position restrict means comprises a flat-plate-shaped member (5) which is formed on the upper half.

15 4. The magnetic tape cassette according to claim 3, wherein said flat-plate-shaped member (5) is disposed in adjacent to a cam groove (2b) which is formed on the upper half (2) so as to guide the freely opened and closed movement of said lid.

20 5. The magnetic tape cassette according to claim 3, wherein said flat-plate-shaped member (15) is continuously extended from one of walls defining a cam groove (2b) which is formed on the upper half (2) so as to guide the freely opened and closed movement of said lid.

25 6. The magnetic tape cassette according to claim 1, wherein said upper half case (140) includes,

30 two eaves portions (161b) projected towards the frond end in a front-rear direction of the magnetic tape cassette and between which said opening is interposed in a right-left direction of the magnetic tape cassette,
two extension portions (162b) respectively further

extended from said two eaves portions towards the front end
in the front-rear direction,

two screw bosses (102) respectively formed on said
two extension portions (162b) for regulating a positional
5 relationship between said upper and lower half case in an
upper-lower direction of the magnetic tape cassette
perpendicular to both of said front-rear direction and said
right-left direction,

two gate marks (B) respectively disposed on lower
10 surfaces of said eave portions and formed by contacting with
a pair of valve gates through which a resin for molding the
upper half case is injected, and

two increased thickness portions (103) respectively
formed on said two eaves portions (161b) and respectively
15 disposed at positions where said two gate marks (B) are
formed,

wherein each of said two increased thickness
portions (103) is continuously connected to said respective
two extension portions (162b) and also is capable of serving
20 as a flow passage of said resin to said respective screw boss
when said upper half case is molded.

7. The magnetic tape cassette according to claim 6,
wherein said upper half case (140) further includes
25 two reinforcing ribs (164) for reinforcing said screw
bosses (102) and for integrally connecting said two eaves
portions (161b), said two extension portions (162b) and said
screw bosses (102), respectively.

30 8. The magnetic tape cassette according to claim 6,

wherein each of said two increased thickness portions (103) is formed into a truncated conical shape.

9. The magnetic tape cassette according to claim 1, wherein said lower half includes:

a pair of magnetic tape height restricting ribs (215a, 215b) respectively disposed in a front end of said lower half in a front-rear direction of said magnetic tape cassette for restricting the height of said magnetic tape, and

a position restrict means (209, 211) having at least one portion (209a, 211a) extended in an upper-lower direction perpendicular to said front-rear direction for restricting a push-in depth of said magnetic tape cassette relative to a reproducing apparatus when said magnetic tape cassette is loaded into said reproducing apparatus, the height of said position restricting means being higher than said magnetic tape height restricting rib in the upper-lower direction.

10. The magnetic tape cassette according to Claim 9, wherein said portion (209a, 211) of said position restrict means (209, 211) is disposed at a position closer to the rear end in the front-rear direction of said magnetic tape cassette than a position of said lid lock (L) which is contactable with a lid lock releasing member (217) of said reproducing apparatus when said magnetic tape cassette is loaded into said reproducing apparatus.

11. The magnetic tape cassette according to claim 9 further comprising:

a pair of reference holes (217a, 217b) for determining a

position of said magnetic tape cassette within said reproducing apparatus,

wherein said position restrict means (209, 211) are substantially disposed on or adjacent to center lines of said reference holes respectively.

12. The magnetic tape cassette according to claim 1, further comprising:

tape guide members (311) formed at the front end on said lower half (304) for guiding said magnetic tape (311) wound around said reels and stretched over said opening, said opening being interposed between said tape guide members in a right-left direction of said magnetic tape cassette,

wherein said lid (327) including,

an outer lid (329) rotatably mounted on said upper half for covering a front surface of said magnetic tape;

a top lid (330) rotatably mounted on said outer lid for covering an upper edge of said magnetic tape; and,

an inner lid (331) rotatably mounted on said top lid for covering a rear surface of said magnetic tape,

wherein

said inner lid (331) includes two slide pins (331c) which are respectively provided on and projected from both end portions of an lower edge of said inner lid (331) in said right-left direction,

said lower half (304) comprises inner lid cam grooves (308) respectively formed in the inner side surface portions of said tape guide members (310) and respectively guiding movements of said two slide pins,

said lower half (304) also comprises a pair

of reference hole portions (313) for determining a position of said magnetic tape cassette relative to a reproducing apparatus into which said magnetic tape cassette is loaded, and

5 said lower half (304) further comprises thickness reducing portions (315) which are respectively formed between said inner lid cam grooves (308) and said reference hole portions (313) in such a manner that the bottom surfaces (315a) of said thickness reducing portions
10 (315) are respectively higher in height from the bottom surface of said lower half than the upper surfaces (313a) of said reference hole portions (313), to thereby form stepped parts between said bottom surfaces and said upper surfaces respectively.

15 13. The magnetic tape cassette according to claim 1, wherein said upper half (411) has upper bosses (480, 481, 413), and lower half (412) has lower bosses (487, 417) and coupled with said upper cassette through screws (478) which
20 are respectively inserted into said lower bosses and then threadedly engaged with said upper bosses, and

 wherein said lower bosses includes

 a front center lower boss (487) which is substantially disposed in a center portion in a right-left direction and in
25 a front end portion in a front-rear direction perpendicular to said right-left direction, and

 a rear center lower boss (417) which is substantially disposed in a center portion in a right-left direction and in a rear end portion in the front-rear direction, and

30 wherein said upper bosses includes

a front center upper boss (481) mating with said front center lower boss, and

a rear center upper boss (413) mating with said rear center lower boss.

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14. The magnetic tape cassette according to claim 13, wherein at least one of upper bosses comprises:

a main cylindrical body (481, 413); and

a positioning rib (482, 414) protruded from said main
10 cylindrical body in a radial direction of said main cylindrical body.

15. The magnetic tape cassette according to claim 1, wherein each of said reels comprises:

15 an upper reel (614) including a flange portion (613) which has a pivot hole (617) and a plurality of welding boss holes (618); and,

a lower reel (616) coupled with said upper reel and including a boss portion (615) which has a surface facing
20 said upper reel,

wherein said boss portion (615) includes,

a boss center portion (621) having a pivot (619) which is provided on and projected from said boss portion (615) and fitted into said pivot hole (617),

25 a side wall (622) separated from said boss center portion (621) in a radial direction of said reel and having a magnetic tape winding surface around which said magnetic tape is wound,

a plurality of welding bosses (620) respectively fitted
30 into said welding boss holes and provided at and projected

from upper surface of base portions (624) which are respectively spaced in the radial direction from said pivot (619), and

5 a plurality of ribs extended in the radial direction for respectively connecting said boss center portion (621) and said side wall (622), said ribs (623) are disposed so as to avoid the base portion of said base portions (624).

16. The magnetic tape cassette according to claim 1,
10 wherein each of reels comprises:

an upper reel (614) including a flange portion (613) which has a pivot hole (617) and a plurality of welding boss holes (618); and,

15 a lower reel (616) coupled with said upper reel and including a boss portion (615) which has a surface facing said upper reel,

wherein said boss portion (615) includes,

a boss center portion (621) having a pivot (619) which is provided on and projected from said boss portion (615) and
20 fitted into said pivot hole (617),

a side wall (622) separated from said boss center portion (621) in a radial direction of said reel and having a magnetic tape winding surface around which said magnetic tape is wound,

25 a plurality of welding bosses (620) respectively fitted into said welding boss holes and provided at and projected from upper surface of base portions (624) which are respectively spaced in the radial direction from said pivot (619), and

30 a plurality of ribs extended in the radial direction for

respectively connecting said boss center portion (621) and said side wall (622), said ribs (623) being separated through a gap from at least a portion containing the upper surface of said base portions (624).

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17. The magnetic tape cassette according to claim 1, further comprising:

tape guides (709a, 709b) formed at the front end on said lower half (704) for guiding said magnetic tape (711) wound
10 around said pair of reels (723, 724) and stretched over said opening, said opening being interposed between said tape guides in a right-left direction of said magnetic tape cassette; and

inner lid cam grooves (708) respectively formed inner
15 surface portions of said tape guides (709a, 709b) of said lower half which are confronted with each other through said opening;

position restrict means (707) disposed on the front surface of said upper half,

20 wherein said lid comprises an inner lid (731) for covering a rear surface of said magnetic tape, said inner lid (731) including two slide pins (731c) respectively provided on and projected from both end portions of the lower edge of said inner lid in the right-left direction, said two slide
25 pins being slidably engageable with said inner lid cam grooves (708), and

said position restrict means (707) is disposed on a front surface of said upper half so as to restrict positions of said slide pins, said position restrict means being
30 contactable with said two slide pins of said inner lid in a

state where said open/close lid is completely opened.

18. The magnetic tape cassette according to claim 17,
wherein slide pin contact surfaces of said position restrict
5 means (707) are situated more forwardly of said magnetic tape
cassette than the upper edge walls of said inner lid cam
grooves (733).

19. The magnetic tape cassette according to claim 17,
10 wherein said lower half (304) comprises a pair of reference
holes portion (313) for determining a position of said
magnetic tape cassette relative to a reproducing apparatus
into which said magnetic tape cassette is loaded, and
wherein the slide pin contact surfaces of said position
15 restrict means are situated on the substantially same plane
as a plane which contains said reference holes and extends in
the right-left direction.

20. A magnetic tape cassette comprising:
upper and lower half cases (140 and 131) coupled to each other through screws (168);

5 a pair of reels (132a, 132b) rotatably stored within said upper and lower half cases and around which a magnetic tape is wound; and

a lid (141, 142, 143) capable of closing an opening formed in a front end of said upper and lower half cases, said lid being openable when pulling out said magnetic tape
10 from said opening,

wherein said upper half case (140) includes,
two eaves portions (161b) projected towards the front end in a front-rear direction of the magnetic tape cassette and between which said opening is interposed in a
15 right-left direction of the magnetic tape cassette,

two extension portions (162b) respectively further extended from said two eaves portions towards the front end in the front-rear direction,

two screw bosses (102) respectively formed on said
20 two extension portions (162b) for regulating a positional relationship between said upper and lower half case in an upper-lower direction of the magnetic tape cassette perpendicular to both of said front-rear direction and said right-left direction,

25 two gate marks (B) respectively disposed on lower surfaces of said eave portions and formed by contacting with a pair of valve gates through which a resin for molding the upper half case is injected, and

two increased thickness portions (103) respectively
30 formed on said two eaves portions (161b) and respectively

disposed at positions where said two gate marks (B) are formed,

wherein each of said two increased thickness portions (103) is continuously connected to said respective two extension portions (162b) and also is capable of serving as a flow passage of said resin to said respective screw boss when said upper half case is molded.

21. A magnetic tape cassette comprising:
10 a cassette case (201) including upper and lower halves (203, 205); and
a pair of magnetic tape reels stored within said cassette case and around which a magnetic tape is wound;
wherein said lower half includes:
15 a pair of magnetic tape height restricting ribs (205a, 205b) respectively disposed in a front end of said lower half in a front-rear direction of said magnetic tape cassette for restricting the height of said magnetic tape, and
a position restrict means (209, 211) having at least one
20 portion (209a, 209b) extended in an upper-lower direction perpendicular to said front-rear direction for restricting a push-in depth of said magnetic tape cassette relative to a reproducing apparatus when said magnetic tape cassette is loaded into said reproducing apparatus, the height of said
25 position restricting means being higher than said of magnetic tape height restricting rib in the upper-lower direction.

22. A magnetic tape cassette, comprising:
a cassette main body (302) including upper and lower
30 halves (303, 304) and forming an opening in a front end

thereof;

tape guide members (31) formed at the front end on
said lower half (304) for guiding a magnetic tape (311) wound
around a pair of reels and stretched over said opening, said
5 opening being interposed between said tape guide members in
a right-left direction;

a lid capable of closing said opening formed in the
front end, said lid being openable when pulling out said
magnetic tape from said opening, and

10 wherein said lid (327) including,

an outer lid (329) rotatably mounted on said
upper half for covering the front surface of said magnetic
tape;

15 a top lid (330) rotatably mounted on said
outer lid for covering the upper edge of said magnetic tape;
and,

an inner lid (331) rotatably mounted on said
top lid for covering the rear surface of said magnetic tape,
wherein

20 said inner lid (331) includes two slide pins (331c)
are respectively provided on and projected from both end
portions of an lower edge of said inner lid (331) in said
right-left direction,

said lower half (304) comprises inner lid cam grooves
25 (308) respectively formed in the inner side surface portions
of said tape guide members (310) and respectively guiding
movements of said two slide pins,

said lower half (304) also comprises a pair of reference
holes portion (313) for determining a position of said
30 magnetic tape cassette relative to a reproducing apparatus

into which said magnetic tape cassette is loaded, and

said lower half (304) further comprises thickness
reducing portions (315) which are respectively formed between
said inner lid cam grooves (308) and said detect holes (13)

5 in such a manner that the bottom surfaces (315a) of said
thickness reducing portions (315) are respectively higher in
height from the bottom surface of said lower half than the
upper surfaces (313a) of said detect hole portions (313), to
thereby form stepped parts between said bottom surfaces and
10 said upper surfaces respectively..

23. A magnetic tape cassette comprising:

upper cassette half (411) having upper bosses;

lower cassette half (412) having lower bosses and

15 coupled with said upper cassette through screws (478) which
are respectively inserted into said lower bosses and then
threadedly engaged with said upper bosses,

wherein said lower bosses includes

20 a front center lower boss (487) which is substantially
disposed in a center portion in a right-left direction and in
a front end portion in a front-rear direction perpendicular
to said right-left direction, and

a rear center lower boss (417) which is substantially
disposed in a center portion in a right-left direction and in
25 a rear end portion in the front-rear direction, and

wherein said upper bosses includes

a front center upper boss (481) mating with said front
center lower boss, and

a rear center upper boss (413) mating with said rear
30 center lower boss.

24. A magnetic tape cassette according to claim 23,
wherein said rear center upper boss (413) is located in
adjacent to a transparent window (414) formed on the upper
5 cassette half (411), to thereby reinforce said transparent
window.

25. A magnetic tape cassette according to claim 23,
wherein said rear center upper boss (413) has a positioning
10 rib (414) relative to said rear center lower boss.

26. A tape reel for use in a magnetic tape cassette,
comprising:

an upper reel (614) including a flange portion (613)
15 which has a pivot hole (617) and a plurality of welding boss
holes (618); and,

a lower reel (616) coupled with said upper reel and
including a boss portion (615) which has a surface facing
said upper reel,

20 wherein said boss portion (615) includes,

a boss center portion (621) having a pivot (619) which
is provided on and projected from said boss portion (615) and
fitted into said pivot hole (617),

a side wall (622) separated from said boss center
25 portion (621) in a radial direction of said boss portion and
having a magnetic tape winding surface around which a
magnetic tape is wound,

a plurality of welding bosses (620) respectively fitted
into said welding boss holes and provided at and projected
30 from upper surface of base portions (624) which are

respectively spaced in the radial direction from said pivot (619), and

5 a plurality of ribs extended in the radial direction for respectively connecting said boss center portion (621) and said side wall (622), said ribs (623) are disposed so as to avoid the base portion of said base portions (624).

27. A tape reel for use in a magnetic tape cassette, comprising:

10 an upper reel (614) including a flange portion (613) which has a pivot hole (617) and a plurality of welding boss holes (618); and,

15 a lower reel (616) coupled with said upper reel and including a boss portion (615) which has a surface facing said upper reel,

wherein said boss portion (615) includes,

a boss center portion (621) having a pivot (619) which is provided on and projected from said boss portion (615) and fitted into said pivot hole (617),

20 a side wall (622) separated from said boss center portion (621) in a radial direction of said boss portion and having a magnetic tape winding surface around which a magnetic tape is wound,

25 a plurality of welding bosses (620) respectively fitted into said welding boss holes and provided at and projected from upper surface of base portions (624) which are respectively spaced in the radial direction from said pivot (619), and

30 a plurality of ribs extended in the radial direction for respectively connecting said boss center portion (621) and

said side wall (622), said ribs (623) being separated through a gap from at least part of said base portions (624) which contains the upper surface of said base portions (624).

5 28. A magnetic tape cassette, comprising:

upper and lower halves (703, 704) and including in the front surface thereof an opening (712) for insertion of a tape pull-out member;

10 tape guides (709a, 709b) formed at the front end on said lower half (704) for guiding a magnetic tape (711) wound around a pair of reels (723, 724) and stretched over said opening, said opening being interposed between said tape guides in a right-left direction;

15 an open/close lid (727) capable of covering said opening (712) in a freely openable and closable manner, said open/close lid comprising an inner lid (731) for covering the rear surface of said magnetic tape, said inner lid (731) including two slide pins (731c) respectively provided on and projected from the two end portions of the lower edge of said
20 inner lid, said two slide pins being slidably engageable with their associated inner lid cam grooves (708) respectively formed in the inner surface portion of said lower half; and

position restrict means (707) disposed on the front surface of said upper half for restricting positions of said
25 slide pins, said position restrict means being conatactable with said two slide pins of said inner lid in a state where said open/close lid is completely opened.

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